CLAIMS

1. A system for the automation of one or more of the design, assembly and packaging of optoelectronic devices comprising:
   (a) an automated manipulation device configured for the manipulation of an optoelectronic device component;
   (b) a knowledge based model derived from a set of one or more parameters for said optoelectronic device;
   (c) a database for storing said knowledge based model;
   (d) a measuring device for taking a measurement of one or more parameters of at least one component of said optoelectronic device; and
   (e) a controller for managing said automated manipulation device, said controller enabled to receive information from said database; wherein said controller comprises an initial set point device which utilizes said knowledge based model to determine an initial set point for said automated manipulation device, and a servo-feedback loop which utilizes said measurement of one or more parameters of at least one component of said optoelectronic device to determine a manipulation of at least one component of said optoelectronic device.

2. A system according to claim 1, wherein said one or more parameters comprises one or more parameters selected from the group consisting of optical waveform characteristics and optical waveform features.

3. A system according to claim 2, wherein the knowledge based model comprises a model employing one or more of optical power, optical intensity, optical phase and optical polarization.

4. A system according to claim 3, wherein the knowledge based model is derived using one or more of a Rayleigh-Sommerfeld formulation, an angular spectrum solution to a Rayleigh-Sommerfeld formulation, a Ray

formulation, a Gaussian formulation, a Fraunhofer Field Formulation, a Fresenel Field formulation, and vector solutions to Maxwell's equations.

5. A system according to claim 4, wherein the knowledge based model is an optical power propagation model.

6. A system according to claim 5, wherein the optical power propagation model is derived using one or more of a Rayleigh Sommerfeld formulation and an angular spectrum solution to a Rayleigh Sommerfeld formulation.

7. A system according to claim 1, further comprising a learning loop which makes adjustments to said knowledge based model based on actual experience in one or more of the design, assembly, packaging, use and maintenance of said optoelectronic device.

8. A system according to claim 7, wherein said set of parameters comprises one or more parameters selected from the group consisting of optical waveform characteristics and optical waveform features.

9. A system according to claim 8, wherein the knowledge based model comprises a model employing one or more of optical power, optical intensity, optical phase and optical polarization.

10. A system according to claim 9, wherein the knowledge based model is derived using one or more of a Rayleigh-Sommerfeld formulation, an angular spectrum solution to a Rayleigh-Sommerfeld formulation, a Ray formulation, a Gaussian formulation, a Fraunhofer Field Formulation, a Fresenel Field formulation, and vector solutions to Maxwell's equations.

11. A system according to claim 10, wherein the knowledge based model is an optical power propagation model.

12. A system according to claim 11, wherein the optical power propagation model is derived using one or more of a Rayleigh Sommerfeld formulation and an angular spectrum solution to a Rayleigh Sommerfeld formulation.

13. A system as claimed in claim 10, wherein at least one said measurement is employed by said learning loop in the adjustment of said knowledge based model.

14. An automated method for one or more of the assembly and packaging of optoelectronic devices comprising the steps of:

(a) providing an automated manipulation device configured for the manipulation of an optoelectronic device component;

(b) determining an initial set point for said automated manipulation device from a knowledge based model;

(c) positioning said automated manipulation device at said set point;

(d) measuring at least one parameter of a component of the optoelectronic device;

(e) adjusting the position of said automated manipulation device based on said measurement; and

(f) repeating steps (d)-(e) until said optoelectronic device is assembled, packaged or assembled and packaged.

15. A method according to claim 14, wherein said at least one parameter comprises one or more parameters selected from the group consisting of optical waveform characteristics and optical waveform features.

16. A method according to claim 15, wherein the knowledge based model comprises a model employing one or more of optical power, optical intensity, optical phase and optical polarization.

17. A method according to claim 16, wherein the knowledge based model is derived using one or more of a Rayleigh-Sommerfeld formulation, an angular spectrum solution to a Rayleigh-Sommerfeld formulation, a Ray

formulation, a Gaussian formulation, a Fraunhofer Field Formulation, a Fresenel Field formulation, and vector solutions to Maxwell's equations.

18. A method according to claim 17, wherein the knowledge based model is an optical power propagation model.

19. A method according to claim 18, wherein the optical power propagation model is derived using one or more of a Rayleigh Sommerfeld formulation and an angular spectrum solution to a Rayleigh Sommerfeld formulation.

20. A method according to claim 19, further comprising a learning loop which makes adjustments to said knowledge based model based on actual experience in one or more of the design, assembly, packaging, use and maintenance of said optoelectronic device.

21. A method according to claim 20, wherein said set of parameters comprises one or more parameters selected from the group consisting of optical waveform characteristics and optical waveform features.

22. A method according to claim 21, wherein the knowledge based model comprises a model employing one or more of optical power, optical intensity, optical phase and optical polarization.

23. A method according to claim 22, wherein the knowledge based model is derived using one or more of a Rayleigh-Sommerfeld formulation, an angular spectrum solution to a Rayleigh-Sommerfeld formulation, a Ray formulation, a Gaussian formulation, a Fraunhofer Field Formulation, a Fresenel Field formulation, and vector solutions to Maxwell's equations.

24. A method according to claim 23, wherein the knowledge based model is an optical power propagation model.